during the first months of the child's life, the attachment process would be interrupted, leaving enduring emotional scars and predisposing a child to behavioral problems.

A mother's bond with her child often starts when she feels fetal movements during pregnancy. Immediately after birth, most, but by no means all, mothers experience a surge of affection that is followed by a feeling that the baby belongs to them. This experience may not occur at all or be delayed under conditions of addiction or postnatal depression (Robson & Kumar, 1980; Kumar, 1997). Yet, like all enduring relationships, it seems that the relationship between mother and child develops gradually and strengthens over time. Some infants who experience severe neglect in early life may develop mentally and emotionally without lasting consequences, for example, if they are adopted and their adoptive parents provide sensitive, stable, and enriching care, or if depressed or substance-abusing mothers recover fully (Koluchova, 1972; Dennis, 1973; Downey & Coyne, 1990). Unfortunately, however, early neglect is all too often the precursor of later neglect. When the child remains subject to deprivation, inadequate or insensitive care, lack of affection, low levels of stimulation, and poor education over long periods of time, later adjustment is likely to be severely compromised (Dennis, 1973; Curtiss, 1977).

In general, it appears that the particular caregiver with whom infants interact (i.e., biological mother or another) is less important for the development of good social relationships than the fact that infants interact over a period of time with someone who is familiar and sensitive (Lamb, 1975; Bowlby, 1988). One of the problems in the later development of children who experience early institutionalization or significant neglect is that there may have been no opportunities for the caretakers and the infants to establish strong and mutual attachments in a reciprocating relationship.

Origins of Language

Recent research has established that successful use of language and communication is a cornerstone of childhood mental health. Not only are strong language capabilities critical to the development of such skills as listening and speaking, but they also are fundamental to the acquisition of proficient reading and writing abilities. In turn, children with a variety of speech and language impediments are at increasing risk as their language abilities fall behind those of their peers. Caretaker and baby start to communicate with each other vocally as well as visually during the first months of life. Many, but not all, developmental psychologists believe that this early pattern of mother-infant reciprocity and interchange is the basis on which subsequent language and communication develop. Various theorists have attempted to explain the relations between language and cognitive development (Vygotsky, 1962; Chomsky, 1965, 1975, 1986; Bruner, 1971; Luria, 1971), but no single theory has achieved preeminence. While a number of theories address language development from different perspectives, all theories suggest that language development depends on both biological and socio-environmental factors. It is clear that language competence is a critical aspect of children's mental health.

Relationships With Other Children

To be healthy, children must form relationships not only with their parents, but also with siblings and with peers. Peer relationships change over time. In the toddler period, children's social skills are very limited; they spend most of their time playing side by side rather than with each other in a give-and-take fashion.

As children grow, their abilities to form close relationships become highly dependent on their social skills. These include an ability to interpret and understand other children's nonverbal cues, such as body language and pitch of voice. Children whose social skills develop optimally respond to what other children say, use eye contact, often mention the other child's name, and may use touch to get attention. If they want to do something that other children oppose, they can articulate the reasons why their plan is a good one. They can suppress their own wishes and desires to reach a compromise with other children and may be willing to change—at least in the presence of another child—a stated belief or wish. When they are with a

group of children they do not know, they are quiet but observant until they have a feeling for the structure and dynamics of the group (Coie & Kuperschmidt, 1983; Dodge, 1983; Putallaz, 1983; Dodge & Feldman, 1990; Kagan et al., 1998).

In contrast, children who lack such skills tend to be rejected by other children. Commonly, they are withdrawn, do not listen well, and offer few if any reasons for their wishes; they rarely praise others and find it difficult to join in cooperative activities (Dodge, 1983). They often exhibit features of oppositional defiant or conduct disorder, such as regular fighting, dominating and pushing others around, or being spiteful (Dodge et al., 1990). Social skills improve with opportunities to mix with others (Bridgeman, 1981). In recent years, knowledge of the importance of children's acquisition of social skills has led to the development and integration of social skills training components into a number of successful therapeutic interventions.

Temperament

During the past two decades, as psychologists began to view the child less as a passive recipient of environmental input but rather as an active player in the process, the importance of temperament has become better appreciated (Plomin, 1986). Temperament is defined as the repertoire of traits with which each child is born; this repertoire determines how people react to the world around them. Such variations in characteristics were first described systematically by Anna Freud from her observations of children orphaned by the ravages of World War II. She noticed that some children were affectionate, some wanted to be close but were too shy to approach adults, and some were difficult because they were easily angered and frustrated (A. Freud, 1965).

The first major longitudinal observations on temperament were begun in the 1950s by Thomas and Chess (1977). They distinguished 10 aspects of temperament, but there appear to be many different ways to describe temperamental differences (Goldsmith et al., 1987). Although there is some continuity in temperamental qualities throughout the life span (Chess & Thomas, 1984; Mitchell, 1993), temperament is often modified during development, particularly by the interaction with the caregiver. For example, a timid child can become bolder with the help of parental encouragement (Kagan, 1984, 1989). Some traits of temperament, such as attention span, goal orientation, lack of distractibility, and curiosity, can affect cognitive functioning because the more pronounced these traits are, the better a child will learn (Campos et al., 1983). Of note, it is not always clear whether extremes of temperament should be considered within the spectrum of mental disorder (for example, shyness or anxiety) or whether certain forms of temperament might predispose a child to the development of certain mental disorders.

Developmental Psychopathology

Current Developmental Theory Applied to Child Mental Health and Illness

A number of central concepts and guiding assumptions underpin our current understanding of children's mental health and illness. These have been variously defined by different investigators (Sroufe & Rutter, 1984; Cicchetti & Cohen, 1995; Jensen, 1998), but by and large these tenets are based on the premise that psychopathology in childhood arises from the complex, multilayered interactions of specific characteristics of the child (including biological, psychological, and genetic factors), his or her environment (including parent, sibling, and family relations, peer and neighborhood factors, school and community factors, and the larger social-cultural context), and the specific manner in which these factors interact with and shape each other over the course of development. Thus, an understanding of a child's particular history and past experiences (including biologic events affecting brain development) is essential to unravel the why's and wherefore's of a child's particular behaviors, both normal and abnormal.

While this principle assumes developmental continuities, to the extent that early experiences are "brought forward" into the current behavior, it is also

important to consider developmental discontinuities, where qualitative shifts in the child's biological, psychological, and social capacities may occur. These may not be easily discerned or predicted ahead of time and may reflect the emergence of new capacities (or incapacities) as the child's psychological self, brain, and social environment undergo significant reorganization.

A second precept underlying an adequate understanding of children's mental health and illness concerns the innate tendencies of the child to adapt to his or her environment. This principle of adaptation incorporates and acknowledges children's "self-righting" and "self-organizing" tendencies; namely, that a child within a given context naturally adapts (as much as possible) to a particular ecological niche, or when necessary, modifies that niche to get needs met. When environments themselves are highly disordered or pathological, children's adaptations to such settings may also be pathologic, especially when compared with children's behaviors within more healthy settings. This principle underscores the likelihood that some (but not all) "pathologic" behavioral syndromes might be best characterized as adaptive responses when the child or adolescent encounters difficult or adverse circumstances. Notably, this ability to adapt behaviorally is reflected at multiple levels, including the level of brain and nervous system structures (sometimes called neuroplasticity).

A third consideration that guides both research-based and clinical approaches to understanding child mental health and illness concerns the importance of age and timing factors. For example, a behavior that may be quite normal at one age (e.g., young children's distress when separated from their primary caretaking figure) can be an important symptom or indicator of mental illness at another age. Similarly, stressors or risk factors may have no, little, or profound impact, depending on the age at which they occur and whether they occur alone or with other accumulated risk factors.

A fourth premise underpinning an adequate understanding of children's mental health and illness concerns the importance of the child's context. Perhaps the most important context for developing children is their caretaking environment. Research with both humans and animals has demonstrated that gross disruptions in this critical parameter have immediate and long-term effects, not just on the young organism's later social-emotional development but also on physical health, long-term morbidity and mortality, later parenting practices, and even behavioral outcomes of its offspring. Moreover, context may play a role in the definition of what actually constitutes psychopathology or health. The same behavior in one setting or culture might be acceptable and even "normative," whereas it may be seen as pathological in another.

Yet another principle central to understanding child mental health and illness is that normal and abnormal developmental processes are often separated only by differences of degree. Thus, supposed differences between normal and abnormal behavior may be better understood by taking into account the differences in the amount or degree of the particular behavior, or the degree of exposure to a particular risk factor. Frequently, no sharp distinctions can be made.

The virtue of these developmental considerations when applied to children is that (a) they enable a broader, more informed search for factors related to the onset of, maintenance of, and recovery from abnormal forms of child behavior; (b) they help move beyond static diagnostic terms that tend to reduce the behaviors of a complex, developing, adapting, and feeling child to an oversimplified diagnostic term; (c) they offer a new perspective on potential targets for intervention, whether child-focused or directed toward environmental or contextual factors; and (d) they highlight the possibility of important timing considerations: windows of opportunity during a child's development when preventive or treatment interventions may be especially effective.

In the sections that follow, these considerations will help the reader understand the important differences from chapters focusing principally on adults, as well as the unique opportunities for intervention that occur because of these differences.

Overview of Risk Factors and Prevention

Current approaches to understanding the etiology of mental disorders in childhood are driven by empirical advances in neuroscience and behavioral research rather than by theories. Epidemiological research on the factors that make children vulnerable to mental illness is important for several reasons: delineating the range of risk factors for particular mental disorders helps to understand their etiology; the populations most at risk can be identified; understanding the relative strength of different risk factors allows for the design of appropriate prevention programs for children in different contexts; and resources can be better allocated to intervene so as to maximize their effectiveness.

Risk Factors

There is now good evidence that *both* biological factors and adverse psychosocial experiences during childhood influence—but not necessarily "cause"—the mental disorders of childhood. Adverse experiences may occur at home, at school, or in the community. A stressor or risk factor may have no, little, or a profound impact, depending on individual differences among children and the age at which the child is exposed to it, as well as whether it occurs alone or in association with other risk factors. Although children are influenced by their psychosocial environment, most are inherently resilient and can deal with some degree of adversity. However, some children, possibly those with an inherent biological vulnerability (e.g., genes that convey susceptibility to an illness), are more likely to be harmed by an adverse environment, and there are some environmental adversities, especially those that are long-standing or repeated, that seem likely to induce a mental disorder in all but the hardiest of children. A recent analysis of risk factors by Kraemer and colleagues (1997) has provided a useful framework for differentiating among categories of risk and may help point this work in a more productive direction.

Risk factors for developing a mental disorder or experiencing problems in social-emotional development include prenatal damage from exposure to alcohol, illegal drugs, and tobacco; low birth weight; difficult temperament or an inherited predisposition to a mental disorder; external risk factors such as poverty, deprivation, abuse and neglect; unsatisfactory relationships; parental mental health disorder; or exposure to traumatic events.

Biological Influences on Mental Disorders

It seems likely that the roots of most mental disorders lie in some combination of genetic and environmental factors—the latter may be biological or psychosocial (Rutter et al., 1999). However, increasing consensus has emerged that biologic factors exert especially pronounced influences on several disorders in particular, including pervasive developmental disorder (Piven & O'Leary, 1997), autism (Piven & O'Leary, 1997), and early-onset schizophrenia (McClellan & Werry, in press). It is also likely that biological factors play a large part in the etiology of social phobia (Pine, 1997), obsessive-compulsive disorder (Leonard et al., 1997), and other disorders such as Tourette's disorder (Leckman et al., 1997).

Two important points about biological factors should be borne in mind. The first is that biological influences are not necessarily synonymous with those of genetics or inheritance. Biological abnormalities of the central nervous system that influence behavior, thinking, or feeling can be caused by injury, infection, poor nutrition, or exposure to toxins, such as lead in the environment. These abnormalities are not inherited. Mental disorders that are most likely to have genetic components include autism, bipolar disorder, schizophrenia, and attention-deficit/hyperactivity disorder (ADHD) (National Institute of Mental Health [NIMH], 1998). Second, it is erroneous to assume that biological and environmental factors are independent of each other, when in fact they interact. For example, traumatic experiences may induce biological changes that persist. Conversely, children with a biologically based behavior may modify their environment. For example, low-birth-weight infants who have sustained brain damage, and thereby become excessively irritable, may change the behavior of caretakers in a way that adversely affects the caretaker's ability to provide good care. Thus, it is now well documented

that a number of biologic risk factors exert important effects on brain structure and function and increase the likelihood of subsequently developing mental disorders. These well-established factors include intrauterine exposure to alcohol or cigarette smoke (Nichols & Chen, 1981), perinatal trauma (Whitaker et al., 1997), environmental exposure to lead (Needleman et al., 1990), malnutrition of pregnancy, traumatic brain injury, nonspecific forms of mental retardation, and specific chromosomal syndromes.

Psychosocial Risk Factors

A landmark study on risks from the environment (Rutter & Quinton, 1977) showed that several factors can endanger a child's mental health. Dysfunctional aspects of family life such as severe parental discord, a parent's psychopathology or criminality, overcrowding, or large family size can predispose to conduct disorders and antisocial personality disorders, especially if the child does not have a loving relationship with at least one of the parents (Rutter, 1979). Economic hardship can indirectly increase a child's risk of developing a behavioral disorder because it may cause behavioral problems in the parents or increase the risk of child abuse (Dutton, 1986; Link et al., 1986; Wilson, 1987; Schorr, 1988). Exposure to acts of violence also is identified as a possible cause of stress-related mental health problems (Jenkins & Bell, 1997). Studies point to poor caregiving practices as being a risk factor for children of depressed parents (Zahn-Waxler et al., 1990).

The quality of the relationship between infants or children and their primary caregiver, as manifested by the security of attachment, has long been felt to be of paramount importance to mental health across the life span. In this regard, the relationship between maternal problems and those factors in children that predispose them to form insecure attachments, particularly young infants' and toddlers' security of attachment and temperament style and their impact on the development of mood and conduct disorders, is of great interest to researchers. Many investigators have taken the view that the nature and the outcome of the attachment process are related to later depression, especially when the child is raised in an abusive environment (Toth & Cicchetti, 1996), and to later conduct disorder (Sampson & Laub, 1993). The relationship of attachment to mental disorders has been the subject of several important review articles (Rutter, 1995; van IJzendoorn et al., 1995).

There is controversy as to whether the key determinant of "insecure" responses to strange situations stems from maternal behavior or from an inborn predisposition to respond to an unfamiliar stranger with avoidant behaviors, such as is found in socially phobic children (Belsky & Rovine, 1987; Kagan et al., 1988; Thompson et al., 1988; Kagan, 1994, 1995). Kagan demonstrated that infants who were more prone to being active, agitated, and tearful at 4 months of age were less spontaneous and sociable and more likely to show anxiety symptoms at age 4 (Snidman et al., 1995; Kagan et al., 1998). These findings are of considerable significance, because long-term study of such highly reactive, behaviorally inhibited infants and toddlers has shown that they are excessively shy and avoidant in early childhood and that this behavior persists and predisposes to later anxiety (Biederman et al., 1993). There is also some controversy as to whether "difficult" temperament in an infant is an early manifestation of a behavior problem, particularly in children who go on to demonstrate such problems as conduct disorder (Olds et al., 1999). One analysis of the attachment literature suggests that abnormal or insecure forms of attachment are largely the *product* of maternal problems, such as depression and substance abuse, rather than of individual differences in the child (van IJzendoorn et al., 1992).

The relationship between a child's temperament and parenting style is complex (Thomas et al., 1968); it may be either protective if it is good or a risk factor if it is poor. Thus, a difficult child's chances of developing mental health problems are much reduced if he or she grows up in a family in which there are clear rules and consistent enforcement (Maziade et al., 1985), while a child exposed to inconsistent discipline is at greater risk for later behavior problems (Werner & Smith, 1992).

Family and Genetic Risk Factors

As noted above in the relationships between temperament and attachment, in some instances the relative contributions of biologic influences and environmental influences are difficult to tease apart, a problem that particularly affects studies investigating the impact of family and genetic influences on risk for childhood mental disorder. For example, research has shown that between 20 and 50 percent of depressed children and adolescents have a family history of depression (Puig-Antich et al., 1989; Todd et al., 1993; Williamson et al., 1995; Kovacs, 1997b). The exact reasons for this increased risk have not been fully clarified, but experts tend to agree that both factors interact to result in this increased risk (Weissman et al., 1997). Family research has found that children of depressed parents are more than three times as likely as children of nondepressed parents to experience a depressive disorder (see Birmaher et al., 1996a and 1996b for review). Parental depression also increases the risk of anxiety disorders, conduct disorder, and alcohol dependence (Downey & Coyne, 1990; Weissman et al., 1997; Wickramaratne & Weissman, 1998). The risk is greater if both parents have had a depressive illness, if the parents were depressed when they were young, or if a parent had several episodes of depression (Merikangas et al., 1988; Downey & Coyne, 1990; McCracken, 1992a, 1992b; Mufson et al., 1992; Warner et al., 1995; Wickramaratne & Weissman, 1998).

Effects of Parental Depression

Depressed parents may be withdrawn and lack energy and consequently pay little attention to, or provide inadequate supervision of, their children. Alternatively, such parents may be excessively irritable and overcritical, thereby upsetting children, demoralizing them, and distancing them (Cohn et al., 1986; Field et al., 1990). At a more subtle level, parents' distress—being pessimistic, tearful, or threatening suicide—is sometimes seen or heard by the child, thereby inducing anxiety. Depressed parents may not model effective coping strategies for stress; instead of "moving on," some provide an example of "giving up" (Garber & Hilsman, 1992). Depression is also often associated with marital discord, which may have its own adverse effect on children and adolescents. Conversely, the behavior of the depressed child or teenager may contribute to family stress as much as being a product of it. The poor academic performance, withdrawal from normal peer activities, and lack of energy or motivation of a depressed teenager may lead to intrusive or reprimanding reactions from parents that may further reduce the youngster's self-esteem and optimism.

The consequences of maternal depression vary with the state of development of the child, and some of the effects are quite subtle (Cicchetti & Toth, 1998). For example, in infancy, a withdrawn or unresponsive depressed mother may increase an infant's distress, and an intrusive or hostile depressed mother may lead the infant to avoid looking at and communicating with her (Cohn et al., 1986). Other studies have shown that if infants' smiles are met with a somber or gloomy face, they respond by showing a similarly somber expression and then by averting their eyes (Murray et al., 1993).

During the toddler stage of development, research shows that the playful interactions of a toddler with a depressed mother are often briefer and more likely to be interrupted (by either the mother or the child) than those with a nondepressed parent (Jameson et al., 1997). Research has shown that some depressed mothers are less able to provide structure or to modify the behavior of excited toddlers, increasing the risk of out-of-control behavior, the development of a later conduct disorder, or later aggressive dealings with peers (Zahn-Waxler et al., 1990; Hay et al., 1992). A depressed mother's inability to control a young child's behavior may result in the child failing to learn appropriate skills for settling disputes without reliance on aggression.

Stressful Life Events

The relationship between stressful life events and risk for child mental disorders is well established (e.g., Garmezy, 1983; Hammen, 1988; Jensen et al., 1991; Garber & Hilsman, 1992), although this relationship in children and adolescents is complicated, perhaps reflecting the impact of individual differences and

developmental changes. For example, there is a relationship between stressful life events, such as parental death or divorce, and the onset of major depression in young children, especially if they occur in early childhood and lead to a permanent and negative change in the child's circumstances. Yet findings are mixed as to whether the same relationship is true for depression in midchildhood or in adolescence (Birmaher et al., 1996a and 1996b; Garrison et al., 1997).

Childhood Maltreatment

Child abuse is a very widespread problem; it is estimated that over 3 million children are maltreated every year in the United States (National Committee to Prevent Child Abuse, 1995). Physical abuse is associated with insecure attachment (Main & Solomon, 1990), psychiatric disorders such as post-traumatic stress disorder, conduct disorder, ADHD (Famularo et al., 1992), depression (Kaufman, 1991), and impaired social functioning with peers (Salzinger et al., 1993). Psychological maltreatment is believed to occur more frequently than physical maltreatment (Cicchetti & Carlson, 1989); it is associated with depression, conduct disorder, and delinquency (Kazdin et al., 1985) and can impair social and cognitive functioning in children (Smetana & Kelly, 1989).

Peer and Sibling Influences

The influence of maladaptive peers can be very damaging to a child and greatly increases the likelihood of adverse outcomes such as delinquency, particularly if the child comes from a family beset by many stressors (Friday & Hage, 1976; Loeber & Farrington, 1998). One way to reduce antisocial behavior in adolescents is to encourage such youths to interact with better adapted youths under the supervision of a mental health worker (Feldman et al., 1983). Sibling rivalry is a common component of family life and, especially in the presence of other risk factors, may contribute to family stresses (Patterson & Dishion, 1988). Although almost universal, in the presence of other risk factors it may be the origin of aggressive behavior that eventually extends beyond the family (Patterson & Dishion, 1988). In stressed or large families, parents have many demands placed on their time and find it difficult to oversee, or place limits on, their young children's behavior. When parental attention is in short supply, young siblings squabbling with each other attract available attention. In such situations, parents rarely comment on good or neutral behavior but do pay attention, even if in a highly critical and negative way, when their children start to fight; as a result, the act of fighting may be inadvertently rewarded. Thus, any attention, whether it be praise or physical punishment, increases the likelihood that the behavior is repeated.

Correlations and Interactions Among Risk Factors

Recent evidence suggests that social/environmental risk factors may combine with physical risk factors of the child, such as neurological damage caused by birth complications or low birth-weight, fearlessness and stimulation-seeking behavior, learning impairments, autonomic underarousal, and insensitivity to physical pain and punishment (Raine et al., 1996, 1997, 1998). However, testing models of the impact of risk factor interactions for the development of mental disorders is difficult, because some of the risk factors are difficult to measure. Thus, the trend these days is to move away from the consideration of *individual* risk factors toward identifying *measurable* risk factors and their *combinations* and incorporating all of them into a single model that can be tested (Patterson, 1996).

The next section describes a series of preventive interventions directed against the environmental risk factors described above.

Prevention

Childhood is an important time to prevent mental disorders and to promote healthy development, because many adult mental disorders have related antecedent problems in childhood. Thus, it is logical to try to intervene early in children's lives before problems are established and become more refractory. The field of prevention has now developed to the point that reduction of risk, prevention of onset, and early intervention are realistic possibilities. Scientific

methodologies in prevention are increasingly sophisticated, and the results from high-quality research trials are as credible as those in other areas of biomedical and psychosocial science. There is a growing recognition that prevention does work; for example, improving parenting skills through training can substantially reduce antisocial behavior in children (Patterson et al., 1993).

The wider human services and law enforcement communities, not just the mental health community, have made prevention a priority. Policymakers and service providers in health, education, social services, and juvenile justice have become invested in intervening early in children's lives: they have come to appreciate that mental health is inexorably linked with general health, child care, and success in the classroom and inversely related to involvement in the juvenile justice system. It is also perceived that investment in prevention may be cost-effective. Although much research still needs to be done, communities and managed health care organizations eager to develop, maintain, and measure empirically supported preventive interventions are encouraged to use a risk and evidence-based framework developed by the National Mental Health Association (Mrazek, 1998).

Some forms of primary prevention are so familiar that they are no longer thought of as mental health prevention activities, when, in fact, they are. For example, vaccination against measles prevents its neurobehavioral complications; safe sex practices and maternal screening prevent newborn infections such as syphilis and HIV, which also have neurobehavioral manifestations. Efforts to control alcohol use during pregnancy help prevent fetal alcohol syndrome (Stratton et al., 1996). All these conditions may produce mental disorders in children.

This section describes several exemplary interventions that focus on enhancing mental health and primary prevention of behavior problems and mental health disorders. Prevention of a disorder or its recurrence or exacerbation is discussed together with that disorder in other sections of this chapter. Prevention strategies usually target high-risk infants, young children, adolescents, and/or their caregivers, addressing the risk factors described above.

Project Head Start

Project Head Start, though generally conceived of as an early childhood intervention program, is probably this country's best known prevention program. In 1965, when it was designed and first implemented in 2,500 communities, Head Start's target population was economically disadvantaged preschool children. Its goal was to improve the social competence of these children through an 8-week comprehensive intervention that included a center-based component and a home visit by community aides, focusing on social, health, and education services (Karoly et al., 1998). A number of psychologists, most notably Jerome Bruner (1971), argued that children can be *trained* to think in a more logical way and that the development of logic is not entirely predetermined. Bruner's views were very influential in launching early intervention programs such as Head Start. There is now ample evidence that, by providing an appropriately stimulating environment, significant advances in knowledge and reasoning ability can be achieved.

The program has served over 15 million children and has cost $31 billion since its inception (General Accounting Office, 1997). It has changed in many ways in the intervening years, and there now is considerable program variation across localities (Zigler & Styfco, 1993). Early evaluations of Head Start showed promising results in terms of higher IQ scores, but over the years many of the findings have met with criticism and skepticism. The reason is that there has been no national randomized controlled trial to evaluate the program as originally designed (Karoly et al., 1998).

Repeated evaluations of Head Start programs that did not employ such a rigorous design (Berrento-Clement et al., 1984; Seitz et al., 1985; Lee et al., 1990; Yoshikawa, 1995) have shown that, although focused early education can improve test scores, the advantage is short-lived. The test scores of children of comparable ability who do not receive early childhood education quickly catch up with those who have been in Head Start programs (Lee et al., 1990). Yet there appear to be

more enduring academic outcomes. A review of 36 studies of Head Start and other early childhood programs found them to lower enrollment in special education and to enhance rates of high school graduation and promotion to the next grade level (Barnett, 1995). Head Start and other forms of early education offer arguably even more important benefits, which do not become apparent until children are older. The advantages are mainly social, rather than cognitive, and include better peer relations, less truancy, and less antisocial behavior (Berrento-Clement et al., 1984; Provence, 1985; Seitz et al., 1985; Webster-Stratton, 1998; Weikart, 1998). Although important from a societal perspective, it is not known whether these very significant benefits are due to direct effects on the child or to the parent education programs that often accompany Head Start programs (Zigler & Styfco, 1993).

Carolina Abecedarian Project

The Carolina Abecedarian Project is an example of an early educational intervention for high-risk children that has been tested more rigorously than Head Start in well-designed, randomized, and controlled trials. It addresses the issue of the timing of the intervention, that is, when an intervention should begin and how long it should continue. Unlike Head Start, children were enrolled in this program at birth and remained in it for several years.

In the Carolina Abecedarian Project, children who had been identified at birth as being at high risk for school failure on the basis of social and economic variables were enrolled in a child-centered prevention-oriented intervention program delivered in a day care setting from infancy to age 5 (Campbell & Ramey, 1994[1]). The preschool intervention operated 8 hours a day for 50 weeks a year and included an infant curriculum to enhance development and parent activities. At elementary school age, a second intervention was provided: the children, who were then in kindergarten, received 15 home visits a year for 3 years from a teacher who prepared a home program to supplement the school's basic curriculum. There were significant positive effects from the two-phase intervention on intellectual development and academic achievement, and these effects were maintained through age 12, which was 4 years after the intervention ended.

Infant Health and Development Program

The Infant Health and Development Program (IHDP) also began at birth and continued for several years and was also designed for low-birth-weight and premature infants (McCarton et al., 1997[2]). The intervention was provided until the children reached 3 years of age. It included pediatric care, home visits, parent group meetings, and center-based schooling 5 days a week from 12 months of age to 3 years. At the end of the intervention, the group receiving it had significantly higher mean IQ scores than did the control group. Of note, although children's behavior problems were not targeted by the intervention, mothers of children in the intervention group reported significantly fewer behavior problems than those in the control group.

Elmira Prenatal/Early Infancy Project

The Elmira Prenatal/Early Infancy Project is an excellent example of a preventive intervention that targeted an at-risk population to prevent the onset of a series of health, social, and mental health problems in children and in their mothers (Olds et al., 1998 and previous years[3]). This study warrants special attention because of its positive and enduring findings, randomized, controlled design, cost-benefit analysis, and unusually long-term follow up of 15 years. The study began by focusing on pregnant women bearing their first child in a small, semirural county in upstate New York. The children of these women were considered high risk because of their mother's young maternal age, single-parent status, or low socio-economic level. There were four study groups to which

[1] Also see Ramey et al., 1984; Ramey & Campbell, 1984; Horacek et al., 1987; Martin et al., 1990.

[2] Also see IHDP, 1990; Ramey et al., 1992; Brooks-Gunn et al., 1994a, 1994b; Casey et al., 1994.

[3] Also see Olds et al., 1986a, 1986b, 1988, 1993, 1994a, 1994b, 1995, and 1997.

random assignment was made. The first group received developmental screening at ages 1 and 2; the second group received screening and free transportation to health care; the third group received screening, transportation, and nurse home visits once every 2 weeks during pregnancy; and the fourth group received all of the above plus continued home visits by a nurse on a diminishing schedule until the infants were 24 months of age. The intervention focused on parent education, enhancement of the women's informal support systems, and linkage with community services.

Women in both groups receiving home visits from nurses had many positive behavioral outcomes compared with groups that received screening only or screening plus transportation. Among the women at highest risk for caregiver dysfunction, those who were visited by a nurse had fewer instances of verified child abuse and neglect during the first 2 years of their children's lives. They were observed in their homes to restrict and punish their children less frequently, and they provided more appropriate play materials. There were no differences between groups in the rates of new cases of child abuse and neglect or in the children's intellectual functioning in the period when the children were 25 to 48 months of age. However, nurse-visited children had fewer behavioral and parental coping problems (as noted in the physician record). Nurse-visited mothers were observed to be more involved with their children than were mothers in the comparison groups.

A cost-benefit analysis estimated program costs (direct costs of nurse visitation, costs of services to which nurses linked families, and costs of transportation) and benefits (cost outcomes presumed to be affected by the program through improved maternal and child functioning, such as less use of Aid to Families With Dependent Children, Medicaid, food stamps, child protective services, and greater tax revenues generated by women's working). Taking a time point of 2 years after the program ended, the net cost of the program for the sample as a whole was $1,582 per family, but for low-income families, the cost of the program was recovered with a dividend of $180 per family.

Fifteen years after the birth of the index child (13 years after termination of the intervention), women who were visited by nurses during pregnancy and infancy had significantly fewer subsequent pregnancies, less use of welfare, fewer verified reports of abuse and neglect, fewer behavioral impairments due to use of alcohol and other drugs, and fewer arrests. Their children, now adolescents, reported fewer instances of running away, fewer arrests, fewer convictions and violations of probation, fewer lifetime sex partners, fewer cigarettes smoked per day, and fewer days having consumed alcohol in the last 6 months. The parents of these adolescents reported that their children had fewer behavioral problems related to use of alcohol and other drugs.

Primary Mental Health Project

The Primary Mental Health Project (PMHP) is a 42-year-old program for early detection and prevention of young children's school adjustment problems. PMHP currently operates in approximately 2,000 schools in 700 school districts nationally and internationally. Seven states in the United States are implementing the program systematically, based on authorizing legislation and state appropriations.

PMHP has four key elements: (1) a focus on primary grade children; (2) systematic use of brief objective screening measures for early identification of children in need; (3) use of carefully selected, trained, closely supervised nonprofessionals (called child associates) to establish a caring and trusting relationship with children; and (4) a changing role for the school professionals that features selection, training, and supervision of child associates, early systematic screening, and functioning as program coordinator, liaison, and consultant to parents, teachers and other school personnel.

The PMHP model has been applied flexibly to diverse ethnic and sociodemographic groups in settings where help is most needed. Over 30 program evaluation studies, including several at the state level, underscore

the program's efficacy (Cowen et al., 1996). Significant improvements were detected in children's grades, achievement test scores, and adjustment ratings by teachers and child associates. PMHP represents a successful mental health intervention that does not require highly trained and skilled mental health professionals.

Other Prevention Programs and Strategies

These and other prevention trials demonstrate that positive adaptation and social-emotional well-being in children and youth can be enhanced, and that risk factors for behavioral and emotional disorders can be reduced, by intervening in home, school, day care, and other settings. Programs have focused not only on mental health problems but also on other problem behaviors (Botvin et al., 1995; St. Lawrence et al., 1995; Kellam & Anthony, 1998).

Other prevention trials are showing similar benefits. For example, a large-scale, four-site school- and home-based prevention trial, known as FastTrack, has shown clear benefits in reducing behavior problems among high-risk children, as well as in reducing needs for and use of special education, which has substantial cost-effectiveness implications (Conduct Problems Prevention Research Group, 1999a, 1999b). Another trial is now under way to test the efficacy of a preventive intervention provided to adolescents whose parents are currently being treated for depression within a health maintenance organization (Clark et al., 1998). Treatment of mood disorders also has potential effectiveness for the primary prevention of suicide, as explained in the later section on Depression and Suicide in Children and Adolescents.

Overview of Mental Disorders in Children

A consideration of developmental principles enhances understanding of mental illness in children and adolescents by reconciling the concept of mental disorder as a stable state or condition with the ongoing development of the child. According to these principles, a mental disorder results from the interaction of a child and his or her environment. Thus, mental illness often does not lie within the child alone. Within the conceptual framework and language of integrative neuroscience, the mental disorder is an "emergent property" of the transaction with the environment. Proper assessment of a child's mood, thought, and behaviors demands a simultaneous consideration of nature and nurture, genes and environment, and biology and psychosocial influences. These relationships are reciprocal. The brain shapes behavior, and learning shapes the brain.

Mental disorders must be considered within the context of the family and peers, school, home, and community. Taking the social-cultural environment into consideration is essential to understanding mental disorders in children and adolescents, as it is in adults. However, the changing nature of these environments, coupled with the progressively unfolding processes of brain development, makes the emphasis on context, as well as development, more complex *and* more central in child mental health (Jensen & Hoagwood, 1997).

Thus, developmental psychopathology encourages consideration of the transactions between the individual and the social and physical environment at the same time that signs and symptoms of mental disorder are considered. Moreover, focusing on diagnostic labels alone provides too limited a view of mental disorders in children and adolescents.

General Categories of Mental Disorders of Children

Mental disorders with onset in childhood and adolescence are listed in Table 3-2 as they appear in DSM-IV. These disorders fall into a number of broad categories, most of which apply not just to children but across the entire life span: anxiety disorders; attention-deficit and disruptive behavior disorders; autism and other pervasive developmental disorders; eating disorders (e.g., anorexia nervosa); elimination disorders

Table 3-2. Selected mental disorders of childhood and adolescence from the DSM-IV

- Anxiety Disorders
- Attention-Deficit and Disruptive Behavior Disorders
- Autism and Other Pervasive Developmental Disorders
- Eating Disorders
- Elimination Disorders
- Learning and Communication Disorders
- Mood Disorders (e.g., Depressive Disorders)
- Schizophrenia
- Tic Disorders

(e.g., enuresis, encopresis); learning and communication disorders; mood disorders (e.g., major depressive disorder, bipolar disorder); schizophrenia; and tic disorders (Tourette's disorder). Several of the more common childhood conditions are described below.

Disorders of anxiety and mood are characterized by the repeated experience of intense internal or emotional distress over a period of months or years. Feelings associated with these conditions may be those of unreasonable fear and anxiety, lasting depression, low self-esteem, or worthlessness. Syndromes of depression and anxiety very commonly co-occur in children. The disorders in this broad group include separation anxiety disorder, generalized anxiety disorder, post-traumatic stress disorder, obsessive-compulsive disorder, major depressive disorder, dysthymia, and bipolar disorder (DSM-IV).

Children who suffer from attention-deficit disorder, disruptive disorder, and oppositional defiant disorder may be inattentive, hyperactive, aggressive, and/or defiant; they may repeatedly defy the societal rules of the child's own cultural group or disrupt a well-ordered environment such as a school classroom.

Children with autism and other pervasive developmental disorders often suffer from disordered cognition or thinking and have difficulty understanding and using language, understanding the feelings of others, or, more generally, understanding the world around them. Such disorders are often associated with severe learning difficulties and impaired intelligence. The disorders in this category include the pervasive developmental disorders, autism, Asperger's disorder, and Rett's disorder (DSM-IV).

It is not uncommon for a child to have more than one disorder or to have disorders from more than one of these groups. Thus, children with pervasive developmental disorders often suffer from ADHD. Children with a conduct disorder are often depressed, and the various anxiety disorders may co-occur with mood disorders. Learning disorders are common in all these conditions, as are alcohol and other substance use disorders (DSM-IV).

Assessment and Diagnosis

As with adults, assessment of the mental function of children has several important goals: to learn the unique functional characteristics of each individual (sometimes called formulation) and to diagnose signs and symptoms that suggest the presence of a mental disorder. Case formulation helps the clinician understand the child in the context of family and community. Diagnosis helps identify children who may have a mental disorder with an expected pattern of distress and limitation, course, and recovery. Both processes are useful in planning for treatment and supportive care. Both are helpful in developing a treatment plan.

Even with the aid of widely used diagnostic classification systems such as DSM-IV (see Chapter 2), diagnosis and diagnostic classification present a greater challenge with children than with adults for several reasons. Children are often unable to verbalize thoughts and feelings. Clinicians by necessity become more reliant on parents, teachers, and other professionals, who may be unable to assess these mental processes in children. Children's normal development also presents an ever-changing backdrop that complicates clinical presentation. As previously noted, some behaviors may be quite normal at one age but suggest mental illness at another age. Finally, the criteria for diagnosing most mental disorders in children are derived from those for adults, even though relatively little research attention has been paid to the validity of these criteria in

children. Expression, manifestation, and course of a disorder in children might be very different from those in adults. The boundaries between normal and abnormal are less distinct and those between one diagnosis and another are fluid.

Thus, the field of childhood mental health historically downplayed diagnosis. This trend began to change in the 1980s, in part as a result of developing practice guidelines and tougher reimbursement standards (Lonigan et al., 1998) and more appropriate diagnostic categories and criteria (DSM III, III-R, and IV). The body of accumulated research on treatment and services referred to throughout this chapter reflects the past emphasis on the efficacy of treatments, sometimes with and sometimes independently of diagnosis.

Most disorders are diagnosed by their manifestations, that is, by symptoms and signs, as well as functional impairment (see Chapter 2). A diagnosis is made when the combination and intensity of symptoms and signs meet the criteria for a disorder listed in DSM-IV. However, diagnosis of childhood mental disorders, as noted earlier, is rarely an easy task. Many of the symptoms, such as outbursts of aggression, difficulty in paying attention, fearfulness or shyness, difficulties in understanding language, food fads, or distress of a child when habitual behaviors are interfered with, are normal in young children and may occur sporadically throughout childhood. Well-trained clinicians overcome this problem by determining whether a given symptom is occurring with an unexpected frequency, lasting for an unexpected length of time, or is occurring at an unexpected point in development. Clinicians with less experience may either overdiagnose normal behavior as a disorder or miss a diagnosis by failing to recognize abnormal behavior. Inaccurate diagnoses are more likely in children with mild forms of a disorder.

Evaluation Process

When conducted by a mental health professional, the evaluation process usually consists of gathering information from several sources: the child, parents, teachers, pediatricians, and hospital records. The mental health professional also makes observations of the child's or teenager's behavior and patterns of speech. Very often, additional testing is requested to assess the child's or youth's intelligence and learning abilities. Information about symptoms can be obtained more reliably by direct questioning (Gittelman-Klein, 1978; Gittelman, 1985).

A full evaluation may take several hours. By that time, the professional should have a good understanding of how the child is functioning at home, at school, and in society and some understanding of the family's characteristics. With this information, the child or adolescent psychiatrist, clinical psychologist, or social worker can suggest further investigations and, if needed, initiate treatment of the child and provide counseling to parents and teachers on how to best assist the child or teenager to overcome problems.

There is a dearth of child psychiatrists, appropriately trained clinical child psychologists, or social workers (Thomas & Holzer, 1999). Furthermore, many barriers remain that prevent children, teenagers, and their parents from seeking help from the small number of specially trained professionals who are available. This places a burden on pediatricians, family physicians, and other gatekeepers (such as school counselors and primary child care workers) to identify children for referral and treatment decisions. These gatekeepers are unlikely to have the time and specialized training to do an evaluation requiring several hours. Their responsibility often is to "triage" cases, that is, refer children who need further evaluation to specialists. Many, however, are involved in treating children and adolescents. They may be greatly aided by various diagnostic aids such as brief questionnaires that can be completed in the waiting room of the pediatrician, the school counseling office, or some other community setting. Ideally, these screening questionnaires would be accompanied by a clear guide on interpreting results and identifying what kind of score or behavior would normally indicate a need for referral to a professional.

Some of the questionnaires that specifically address mood disorders are shown in Figure 3-1. Other questionnaires, such as the Adolescent Antisocial Self-Report Behavior Checklist (Kulik et al., 1968), the Eyberg Child Behavior Inventory (Eyberg & Robinson, 1983), and the Family Interaction Coding Pattern (Patterson, 1982), assess antisocial behavior. Adults and teachers can use instruments such as the Child Behavior Checklist (Achenbach & Edelbrock, 1983) to assess a relatively full range of behavioral and emotional symptoms and disorders from the perspective of adult informants. The Minnesota Multiphasic Personality Inventory-2 (MMPI-2; Hathaway & McKinley, 1989) and the Millon Adolescent Personality Inventory (MAPI) (Millon et al., 1982) questionnaires may be used with adolescents to assess normal and abnormal personality function.

Figure 3-1. Questionnaires used to assess childhood mood disorders

Title	Source
The Children's Depression Inventory (CDI)	Kovacs, 1985
Beck Depression Inventory (BDI)	Beck, Ward, Mendelson, Mock, & Erbaugh, 1961
Reynolds Adolescent Depression Scale (RADS)	Reynolds, 1986
Children's Depression Scale (CDS)	Tisher & Lang, 1983
Center for Epidemiological Studies of Depression (CES-D)	Radloff, 1977
Kandel Depression Scale (KDS)	Kandel & Davies, 1982
Zung Self-Rating Depression Scale (SDS)	Zung, 1965
Diagnostic Interview Schedule for Children (DISC)	Shaffer & Fisher, 1998

The advent of highly structured, computer-driven assessment tools, such as the NIMH Diagnostic Interview Schedule for Children, which comes in a spoken version that can be given through headphones to children and/or their parents (Shaffer et al., 1996a), promises to greatly improve the ability of professionals outside of the mental health field to obtain robust diagnostic information, which can guide them in decisions about further referral or treatment.

Treatment Strategies

Children and adolescents receive most of the traditional treatments described in Chapter 2, particularly psychosocial treatments, such as psychotherapies, and various medications. Specific psychosocial and pharmacological treatment approaches are described in subsequent sections on specific mental disorders. Much of the research, however, has been conducted on adults, with results extrapolated to children. Some of the treatments, such as interactive or play therapy with young children, are unique to clinical work with this group, while others, such as individual psychotherapy with adolescents, are similar to clinical work with adults. Many of the treatment interventions have been "packaged" together in particular arrangements for delivery in specific clinical settings.

More attention is being paid to the value of multimodal therapies, that is, the combination of pharmacological and psychosocial therapies. While research is limited, multimodal studies have shown benefits for treatment of ADHD (see later section), anxiety (Kearney & Silverman, 1998), and depression. Tempering the value of psychotherapy as well as pharmacotherapy, which is discussed below, is that the efficacy of these therapies in the research setting is greater than that in the real world. The problem of the

gap between research and clinical practice is discussed in greater depth elsewhere in this chapter and in Chapter 2.

Psychotherapy

The major types of psychotherapy for children are supportive, psychodynamic, cognitive-behavioral, interpersonal, and family systemic. With the exception of the latter, these therapies originally were developed for adults and then tailored for use in children.

Most psychotherapies are deemed effective for children and adolescents because they improve more than with no treatment, as discussed later in this chapter under Treatment Interventions (Casey & Berman, 1985; Hazelrigg et al., 1987; Weisz et al., 1987; Kazdin et al., 1990; Baer & Nietzel, 1991; Grossman & Hughes, 1992; Shadish et al., 1993; Weisz & Weiss, 1993; Weisz et al., 1995). But despite this strong body of research on children comparing treatment with no treatment, far less attention has been paid to, and guidance provided about, the efficacy of a given psychotherapy for a specific diagnosis (Lonigan et al., 1998). In other words, it is not clear which therapies are best for which conditions. The American Psychological Association sought to rectify this problem by convening two task forces, the second of which exhaustively reviewed the professional literature to evaluate the strength of the evidence for treating individual disorders in children. The second task force refined two sets of criteria against which to evaluate the evidence: the first, and more rigorous, set of criteria was for *Well-Established Psychosocial Interventions*, while the other was for *Probably Efficacious Psychosocial Interventions* (Lonigan et al., 1998). The findings of the task force's comprehensive evaluation were published, disorder by disorder, in an entire issue of the *Journal of Clinical Child Psychology* in June 1998. While findings relating to individual disorders are presented in the next section of this chapter, this was the overarching conclusion: ". . . the majority of these [psychosocial] interventions do not meet criteria for the highest level of empirical support, the well-established criteria" (Lonigan et al., 1998). The problem, according to these authors, is that too few well-controlled studies have been performed for each disorder. To meet the criteria for a *Well-Established Psychosocial Intervention*, there must be at least two well-conducted group-design studies conducted by different teams of researchers, among other criteria.[4] Hereafter, these criteria are referred to as the American Psychological Association Task Force Criteria.

Some other general points are warranted about the value of psychotherapies for children. Psychotherapies are especially important alternatives for those children who are unable to tolerate, or whose parents prefer them not to take, medications. They also are important for conditions for which there are no medications with well-documented efficacy. They also are pivotal for families under stress from a child's mental disorder. Therapies can serve to reduce stress in parents and siblings and teach parents strategies for managing symptoms of the mental disorder in their child (see later sections on Disruptive Disorders and Home-Based Services).

Psychopharmacology

Dramatic increases have occurred over the past decade in the use of pharmacological therapies for children and adolescents with mental disorders, but research has lagged behind the surge in their use (Jensen et al., 1999). Our gaps in knowledge span three areas in particular. First, for most prescribed medications, there are no studies of safety and efficacy for children and adolescents. This is true for medications for mental disorders as well as for somatic disorders. Depending on the specific medication, evidence may be lacking for short-term, or most commonly, for long-term safety and efficacy. The problem is even more pronounced with newer medications, most of which have been introduced into the market for adults. Only in the case of psychostimulants for ADHD is there an adequate body of research on their safety and efficacy in children and adolescents, albeit short-term information only (Greenhill et al., 1998) (see later section on ADHD). Second, there is often limited information about pharmacokinetics, that is, drug concentrations in body

[4] The criteria are listed in Chapter 1.

fluids and tissues over time (Clein & Riddle, 1996). Most of what is known about pharmacokinetics comes from studies of adults. But pediatric pharmacokinetic studies are crucial to identifying the appropriate dose and dose frequency for children of different ages and body sizes. Third, the combined effectiveness of pharmacological and psychosocial treatments, that is, multimodal treatments, is seldom studied. Multimodal treatments have the potential to yield dose reductions in pharmacological treatments, thereby improving the side-effect profile, parental acceptance, and patient compliance.

The dearth of research on children and adolescents has allowed for widespread "off-label" use of medications. This means that, for this population, physicians who are prescribing a given drug do not have the benefit of research and drug labeling information developed by the sponsor and approved by the Food and Drug Administration (FDA). Under U.S. food and drug law, a drug is approved by the FDA only for a defined population. Yet after its approval and market availability, physicians are at liberty to prescribe it for anyone, even though the sponsor only is allowed to *market* the drug for the approved population (which typically is adults) (FDA, 1998). Fortunately, there is a large body of clinical experience with children and adolescents to guide prescribing practices, despite few controlled studies (Green, 1996).

There are several reasons for the paucity of research on medications for children and adolescents. One is greater caution on the part of both the medical profession and parents to experiment with children or to prescribe drugs with potentially serious side effects. Another reason is the need for compliance with dosing requirements of the clinical trial protocol. When children are research subjects, enforcing compliance is generally perceived to be more difficult. Researchers must rely on parents to assess the degree of compliance. A final reason is the cost of research. Once drugs have reached the market for adults, pharmaceutical companies have fewer financial incentives to conduct expensive and methodologically demanding studies with children, to whom drugs may be given through off-label prescribing. The problem has been significant enough to have galvanized Congress into passing legislation, the FDA Modernization Act of 1997, to create financial incentives for drug sponsors to conduct research with pediatric subjects [FDA, 1999 Title 21 USC 505A(g)]. The FDA Modernization Act may help alleviate this problem, but it is too early to tell.

Despite the relative lack of information concerning safety and efficacy of psychotropic agents in children, six scientific reviews have been completed recently; these reviews comprehensively surveyed all available published research concerning the safety and efficacy of psychotropic medication, focusing on six general classes of medication: the psychostimulants (Greenhill et al., 1998), the mood stabilizers and antimanic agents (Ryan et al., 1999), the selective serotonin reuptake inhibitors (SSRIs) (Emslie et al., 1999), antidepressants (Geller et al., 1998), antipsychotic agents (Campbell et al., 1999), and other miscellaneous agents (Riddle et al., 1998).

Review of this comprehensive body of research evidence indicates strong support for the safety and efficacy of several classes of agents for several conditions, specifically, SSRIs for childhood/adolescent obsessive-compulsive disorder, and the psychostimulants for ADHD. For many other disorders and medications, however, information from rigorously controlled trials is sparse or altogether absent (see Figure 3-2). Further, only in the area of ADHD is information now emerging on longer term safety and efficacy, as well as on the merits of combining psychopharmacologic and psychotherapeutic treatments.

Given the inadequacy of efficacy data for most nonstimulant psychotropics, studies are needed for the majority of agents. However, efficacy data appear to be most urgently needed for SSRIs, mood stabilizers, and novel antipsychotics, since the level of usage of these medications appears to be highest among the growing list of psychotropic medications used in youth (Fisher & Fisher, 1996). In contrast to adult psychopharmacology that is focusing on differential efficacy and speed of onset of these categories of psychotropics,

Figure 3-2. Grading the Level of Evidence for Efficacy of Psychotropic Drugs in Children

Category	Indication	Level of Supporting Data: Short-Term Efficacy	Long-Term Efficacy	Short-Term Safety	Long-Term Safety	Estimated Frequency of Use: Rank
Stimulants	ADHD	A	B	A	A	1
Selective Serotonin Reuptake Inhibitors	Major depression	B	C	A	C	2
	OCD	A	C	A	C	
	Anxiety disorders	C	C	C	C	
Central Adrenergic Agonists	Tourette syndrome	B	C	B	C	3
	ADHD	C	C	C	C	
Valproate and Carbamazepine	Bipolar disorders	C	C	A	A	4
	Aggressive conduct	C	C	A	A	
Tricyclic Antidepressants	Major depression	C	C	B	B	5
	ADHD	B	C	B	B	
Benzodiazepines	Anxiety disorders	C	C	C	C	6
Antipsychotics	Childhood schizophrenia and psychoses	B	C	C	B	7
	Tourette syndrome	A	C	B	B	
Lithium	Bipolar disorders	B	C	B	C	8
	Aggressive conduct	B	C	C	C	

Key: A = ≥ 2 randomized controlled trials (RCTs).
B = At least 1 RCT.
C = Clinical opinion, case reports, and uncontrolled trials.

Source: Jensen et al., 1999

pediatric psychopharmacology needs basic studies of efficacy.

Additional information on specific medication treatment is presented in the succeeding sections, providing more detailed discussion of particular disorders. Indepth information is presented on two disorders where a great deal of research has been done, namely, ADHD and major depressive disorder, followed by briefer discussions of other childhood mental disorders.

Attention-Deficit/Hyperactivity Disorder

As its name implies, attention-deficit/hyperactivity disorder (ADHD) is characterized by two distinct sets of symptoms: inattention and hyperactivity-impulsivity (see Table 3-3). Although these problems usually occur together, one may be present without the other to qualify for a diagnosis (DSM-IV). Inattention or attention deficit may not become apparent until a child enters the challenging environment of elementary school. Such children then have difficulty paying attention to details and are easily distracted by other events that are occurring at the same time; they find it difficult and unpleasant to finish their schoolwork; they put off anything that requires a sustained mental effort; they are prone to make careless mistakes, and are disorganized, losing their school books and assignments; they appear not to listen when spoken to and often fail to follow through on tasks (DSM-IV; Waslick & Greenhill, 1997).

Table 3-3. DSM-IV criteria for Attention-Deficit/Hyperactivity Disorder

A. Either (1) or (2):

(1) six (or more) of the following symptoms of **inattention** have persisted for at least 6 months to a degree that is maladaptive and inconsistent with developmental level:
Inattention

(a) often fails to give close attention to details or makes careless mistakes in schoolwork, work, or other activities
(b) often has difficulty sustaining attention in tasks or play activities
(c) often does not seem to listen when spoken to directly
(d) often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (not due to oppositional behavior or failure to understand instructions)
(e) often has difficulty organizing tasks and activities
(f) often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (such as schoolwork or homework)
(g) often loses things necessary for tasks or activities (e.g., toys, school assignments, pencils, books, or tools)
(h) is often easily distracted by extraneous stimuli
(i) is often forgetful in daily activities

(2) six (or more) of the following symptoms of **hyperactivity-impulsivity** have persisted for at least 6 months to a degree that is maladaptive and inconsistent with developmental level:

Hyperactivity

(a) often fidgets with hands or feet or squirms in seat
(b) often leaves seat in classroom or in other situations in which remaining seated is expected
(c) often runs about or climbs excessively in situations in which it is inappropriate (in adolescents or adults, may be limited to subjective feelings of restlessness)
(d) often has difficulty playing or engaging in leisure activities quietly
(e) is often "on the go" or often acts as if "driven by a motor"
(f) often talks excessively

Impulsivity

(g) often blurts out answers before questions have been completed
(h) often has difficulty awaiting turn
(i) often interrupts or intrudes on others (e.g., butts into conversations or games)

B. Some hyperactive-impulsive or inattentive symptoms that cause impairment were present before age 7 years.

C. Some impairment from the symptoms is present in two or more settings (e.g., at school [or work] and at home).

D. There must be clear evidence of clinically significant impairment in social, academic, or occupational functioning.

E. The symptoms do not occur exclusively during the course of a pervasive developmental disorder, schizophrenia, or other psychotic disorder and are not better accounted for by another mental disorder (e.g., mood disorder, anxiety disorder, dissociative disorder, or a personality disorder).

The symptoms of hyperactivity may be apparent in very young preschoolers and are nearly always present before the age of 7 (Halperin et al., 1993; Waslick & Greenhill, 1997). Such symptoms include fidgeting, squirming around when seated, and having to get up frequently to walk or run around. Hyperactive children have difficulty playing quietly, and they may talk excessively. They often behave in an inappropriate and uninhibited way, blurting out answers in class before the teacher's question has been completed, not waiting their turn, and interrupting often or intruding on others' conversations or games (Waslick & Greenhill, 1997).

Many of these symptoms occur from time to time in normal children. However, in children with ADHD they occur very frequently and in several settings, at home and at school, or when visiting with friends, and they interfere with the child's functioning. Children suffering from ADHD may perform poorly at school; they may be unpopular with their peers, if other children perceive them as being unusual or a nuisance; and their behavior can present significant challenges for parents, leading some to be overly harsh (DSM-IV).

Inattention tends to persist through childhood and adolescence into adulthood, while the symptoms of motor hyperactivity and impulsivity tend to diminish with age. Many children with ADHD develop learning difficulties that may not improve with treatment (Mannuzza et al., 1993). Hyperactive behavior is often associated with the development of other disruptive disorders, particularly conduct and oppositional-defiant disorder (see Disruptive Disorders). The reason for the relationship is not known. Some believe that the impulsivity and heedlessness associated with ADHD interfere with social learning or with close social bonds with parents in a way that predisposes to the development of behavior disorders (Barkley, 1998).

Even though a great many children with this disorder ultimately adjust (Mannuzza et al., 1998), some—especially those with an associated conduct or oppositional-defiant disorder—are more likely to drop out of school and fare more poorly in their later careers than children without ADHD. As they grow older, some teens who have had severe ADHD since middle childhood experience periods of anxiety or depression. This seems to be especially common in children whose predominant symptom is inattention (Morgan et al., 1996). Excellent reviews of ADHD can be found in DSM-IV and other sources.[5]

Prevalence

ADHD, which is the most commonly diagnosed behavioral disorder of childhood, occurs in 3 to 5 percent of school-age children in a 6-month period (Anderson et al., 1987; Bird et al., 1988; Esser et al., 1990; Pelham et al., 1992; Shaffer et al., 1996c; Wolraich et al., 1996). Pediatricians report that approximately 4 percent of their patients have ADHD (Wolraich et al., 1990), but in practice the diagnosis is often made in children who meet some, but not all, of the criteria recommended in DSM-IV (Wolraich et al., 1990) (see also Treatment later in this section). Boys are four times more likely to have the illness than girls are (Ross & Ross, 1982). The disorder is found in all cultures, although prevalences differ; differences are thought to stem more from differences in diagnostic criteria than from differences in presentation (DSM-IV).

Causes

The exact etiology of ADHD is unknown, although neurotransmitter deficits, genetics, and perinatal complications have been implicated. In the early post-World War II years, a number of pediatricians, neurologists, and child psychiatrists noted that brain-damaged children were often hyperactive (Strauss & Lehtinen, 1947; Eisenberg, 1957; Laufer & Denhoff, 1957). These observations led to the diagnostic concept of "minimal brain damage" (Wender, 1971), which was thought to be characterized by hyperactivity, inattention, learning difficulties, and a wide variety of behavior problems. However, large epidemiological studies (Rutter & Quinton, 1977) of grossly brain-damaged children with cerebral palsy, epilepsy, and so

[5] Taylor, 1994; Cantwell, 1996; Waslick & Greenhill, 1997; Barkley, 1998; and NIH Consensus Statement 110, 1998.

forth, did not find an excess of hyperactivity, and more recent imaging studies have found no evidence of gross brain damage in children with ADHD (Swanson et al., 1998). The past view that ADHD is a form of minimal brain damage has therefore been abandoned by experts. Many brain-damaged children are, if anything, significantly underactive.

In the late 1970s, it was postulated that the core problem in hyperkinetic children was one of inattention (Douglas & Peters, 1979). This view led, in 1980, to the adoption, in the official DSM-III (American Psychiatric Association, 1980) nomenclature, of the new diagnostic label *attention-deficit disorder.*

Because the symptoms of ADHD respond well to treatment with stimulants, and because stimulants increase the availability of the neurotransmitter dopamine, the "dopamine hypothesis" has gained a wide following. The dopamine hypothesis posits that ADHD is due to inadequate availability of dopamine in the central nervous system. The neurotransmitter dopamine plays a key role in initiating purposive movement, increasing motivation and alertness, reducing appetite, and inducing insomnia, effects that are often seen when a child responds well to methylphenidate. The dopamine hypothesis has thus driven much of the recent research into the causes of ADHD.

The fact that ADHD runs in families suggests that inheritance is an important risk factor. Between 10 and 35 percent of children with ADHD have a first-degree relative with past or present ADHD. Approximately one-half of parents who had ADHD have a child with the disorder (Biederman et al., 1995). Over the past decade, a large number of twin studies have shown that, when ADHD is present in one twin, it is significantly more likely also to be present in an identical twin than in a fraternal twin (Goodman & Stevenson, 1989). These findings have led geneticists to estimate that genes are important in a high proportion of children with ADHD.

Research to pinpoint abnormal genes is honing in on two genes: a dopamine-receptor (DRD) gene on chromosome 11 and the dopamine-transporter gene (DAT1) on chromosome 5 (Cook et al., 1995; Smalley et al., 1998). Several studies have found evidence that children with ADHD have genetic variations in one of the dopamine-receptor genes (DRD4), although the largest of these studies suggests that the presence of such a variation is associated with only a modest increase in the risk of developing ADHD (Smalley et al., 1998). Several other studies have found evidence for abnormalities of the dopamine-transporter gene (DAT1) in children with very severe forms of ADHD (Cook et al., 1995; Gill et al., 1997; Waldman et al., 1998).

Yet for most children with ADHD, the overall effects of these gene abnormalities appear small, suggesting that nongenetic factors also are important. Although none of the many imaging studies have found evidence of gross brain damage, some investigators have suggested that exposure to toxins, such as lead, or episodes of oxygen deprivation for the fetus, as may occur during some complications of pregnancy, may adversely affect dopamine-rich areas of the brain. These theories support observations that hyperactivity and inattention are more common in children whose mothers smoked during pregnancy (Nichols & Chen, 1981), in children who have been exposed to high quantities of lead (Needleman et al., 1990), and in children who had a lack of oxygen in the neonatal period (Whittaker et al., 1997).

Some investigators have noted that the parents of hyperactive children are often overintrusive and overcontrolling (Carlson et al., 1995). It has therefore been suggested that such parental behavior is another possible risk factor for ADHD. However, others have noted that, when children are treated with methylphenidate, there is a reduction in parental negativity and intrusiveness. This suggests that the observed overintrusive and overcontrolling behavior of the parent is a response to the child's behavior rather than the cause (Barkley et al., 1985).

Treatment

The American Academy of Child and Adolescent Psychiatry (AACAP) published "practice parameters" (i.e., guidelines for clinical practice) on the diagnosis and treatment of ADHD. The AACAP parameters include an extensive literature review, detailed descriptions of the clinical presentation of the disorder, and recommendations for treatment. The practice parameters state that "the cornerstones of treatment are support and education of parents, appropriate school placement, and pharmacology" (AACAP, 1991). These practice parameters evolved out of research relating to two major types of treatment: pharmacological treatment and psychosocial treatment, particularly behavioral modification, as well as multimodal treatment, the combination of psychosocial and pharmacological treatments.

Pharmacological Treatment

Psychostimulants

Pharmacological treatment with psychostimulants is the most widely studied treatment for ADHD. Stimulant treatment has been used for childhood behavioral disorders since the 1930s (Bradley, 1937). Psychostimulants are highly effective for 75 to 90 percent of children with ADHD. At least four separate psychostimulant medications consistently reduce the core features of ADHD in literally hundreds of randomized controlled trials: methylphenidate, dextroamphetamine, pemoline, and a mixture of amphetamine salts (Spencer et al., 1995; Greenhill, 1998a, 1998b; Greenhill et al., 1998).

These medications are metabolized, leave the body fairly quickly, and work for 1 to 4 hours. Administration is timed to meet the child's school schedule, to help the child pay attention and meet his or her academic demands, and to mitigate side effects. These medications have their greatest effects on symptoms of hyperactivity, impulsivity, and inattention and the associated features of defiance, aggression, and oppositionality. They also improve classroom performance and behavior and promote increased interaction with teachers, parents, and peers. Small effects were found on learning and school achievement (see reviews by Barkley, 1990; Pelham, 1993; Swanson et al.,1993, 1995b; Greenhill et al., 1998; Cantwell, 1996a; Spencer et al., 1996.) However, psychostimulants do not appear to achieve long-term changes in outcomes such as peer relationships, social or academic skills, or school achievement (Pelham et al., 1998).

Children who do not respond to one stimulant may respond to another (Elia et al., 1991; Elia & Rapoport, 1991). Children should be reevaluated without the medication to see if stimulant treatment is still indicated. Many families choose to have their child take a "drug holiday" on weekends and vacations to reduce overall exposure, but the utility of this strategy has not been demonstrated (AACAP, 1991).

Dosing

Stimulants are usually started at a low dose and adjusted weekly (AACAP, 1991). A recent study demonstrated that the practice of dosing methylphenidate on the basis of body weight fails to predict the optimal dose of medication (Rapport & Denney, 1997). One of the goals of the recently completed NIMH Multimodal Treatment Study of ADHD (described more fully below) was to develop medication strategies to guide "best dose," dose changes, management of side effects, and integration with other treatments (Greenhill et al., 1996).

Side Effects

Common stimulant side effects include insomnia, decreased appetite, stomach aches, headaches, and jitteriness. Some children may develop tics, but a recent study suggests that they disappear with continued treatment (Gadow et al., 1995). Rebound activation (i.e., a sudden increase in attention deficit and hyperactivity) has been noted anecdotally after the child's last dose of medication wears off (Johnston et al., 1988). Most of the side effects are mild, recede over time, and respond to dose changes. Children rarely experience cognitive impairment, which, if it does occur, can be resolved with reduction or cessation of the drug (Cantwell, 1996). A few cases of psychosis have been reported. Pemoline has been associated with hepatotoxicity, so monitoring of liver function is

necessary. Two studies have shown no long-term effects of stimulants on later height or weight (Klein & Mannuzza, 1988; Vincent et al., 1990). Nonetheless, regular precautionary monitoring of weight and height for children on stimulants is recommended.

Other Medications

For children with ADHD who do not respond to stimulants (10 to 30 percent) or cannot tolerate the side effects, there are other useful medications. The antidepressant bupropion has been found to be superior to placebo, although the response is not as strong as that found with stimulants (Cantwell, 1998). Bupropion can also be used as an adjunct to augment stimulant treatment. Well-controlled trials have shown tricyclic antidepressants to be superior to placebo but less effective than stimulants (Elia et al., 1991; Elia & Rapoport, 1991). Reports of sudden death of a few children in the early 1990s on the tricyclic compound desipramine led to great caution with the use of tricyclics in children (Riddle et al., 1991).

Considerable controversy surrounds the use of central alpha-adrenergic blocking drugs, such as clonidine and guanfacine, to treat ADHD. There is some evidence that clonidine is effective for ADHD when it occurs with a tic disorder (Hunt, 1987; Hunt et al., 1990, 1995). Caution is warranted in view of the four cases of sudden death that have been reported in children taking methylphenidate and clonidine together and of a number of reports of nonfatal cardiac side effects in children taking clonidine alone or in combination (Swanson et al., 1995a).

Neuroleptics have been found to be occasionally effective (Green, 1995), yet the risk of movements disorders, such as tardive dyskinesia, makes their use problematic. Lithium, fenfluramine, or benzodiazapines have not been found to be effective treatments for ADHD (Cantwell, 1996a; Green, 1995), nor have SSRIs, such as fluoxetine (Goldman et al., 1998). Furthermore, more than 20 studies have shown that dietary manipulation (e.g., the Feingold diet) is not efficacious (Mattes & Gittelman, 1981), and controlled studies failed to demonstrate that sugar exacerbates the symptoms of children with ADHD (Milich & Pelham, 1986).

Psychosocial Treatment

Important options for the management of ADHD are psychosocial treatments, particularly in the form of training in behavioral techniques for parents and teachers. Behavioral techniques, which are described more fully below, typically employ "time-out," point systems and contingent attention (adults reinforcing appropriate behavior by paying attention to it). Psychosocial treatments are useful for the child who does not respond to medication at all or for whom the therapeutic benefits of the medication have worn off and for the child who responds only partially to medication or cannot tolerate medication. In addition, some families express a strong preference not to use medication. Even children who are receiving medication may continue to have residual ADHD symptoms or symptoms from other disorders, such as oppositional defiant disorder or depression, which make specialized child management skills necessary and helpful (see next section, Multimodal Treatments). Furthermore, children with ADHD can present a challenge that puts significant stress on the family. Skills training for parents can help reduce this stress on parents and siblings.

Behavioral Approaches

The main psychosocial treatments for ADHD are behavioral training for parent and teacher, as well as systematic programs of contingency management (this behavioral technique is described in more detail in the Treatment section later in this chapter). Of these options, systematic programs of intensive contingency management conducted in specialized classrooms or summer camps with the setting controlled by highly trained individuals is the most effective (Abramowitz et al., 1992; Carlson et al., 1992; Pelham & Hoza, 1996). The efficacy of behavioral training of teachers is *well-established*, while the evidence for parent training is less solid, according to the criteria, noted earlier, promulgated by the American Psychological

Association Task Force (Pelham et al., 1998). There is, however, indirect support for the effectiveness of parent training in the literature, demonstrating the efficacy of parent training for children with oppositional defiant disorder who share many characteristics with children who have ADHD (see section on Disruptive Disorders).

A number of studies have compared parent training (Gittelman et al., 1980; Firestone et al., 1986; Horn et al., 1987, 1990, 1991; Pelham et al., 1988) or school-based behavioral modification (Gittelman et al., 1980; Pelham et al., 1988) with the use of stimulants. Most of the studies are of outpatient behavioral therapy programs in which parents meet in groups and are taught behavioral techniques such as time out, point systems, and contingent attention. Teachers are taught similar classroom strategies, as well as the use of a daily report card for parents that evaluates the child's in-school behavior. The improvements in the symptoms of ADHD achieved with psychosocial treatments are not as large as those found with psychostimulants (Pelham et al., 1998). Behavioral interventions tend to improve targeted behaviors or skills but are not as helpful in reducing the core symptoms of inattention, hyperactivity, or impulsivity. Questions remain about the effectiveness of these treatments in other settings. To be fully effective, treatments for ADHD need to be conducted across settings (school, home, community) and by different people (e.g., parents, teachers, therapists)—a consistency and comprehensiveness that can be hard to achieve.

Cognitive-Behavioral Therapy

Cognitive-behavioral therapy (CBT), primarily training in problem solving and social skills, has not been shown to provide clinically important changes in behavior and academic performance of children with ADHD (Pelham et al., 1998). However, CBT might be helpful in treating symptoms of accompanying disorders such as oppositional defiant disorder, depression, or anxiety disorders (Abikoff, 1985; Hinshaw & Ehardt, 1991; Lochman, 1992).

Psychoeducation

Although there are no studies evaluating the efficacy of psychoeducation as a treatment modality for ADHD, providing information to parents, children, and teachers about ADHD and treatment options is considered critical in the development of a comprehensive treatment plan (AACAP, 1991). Educational accommodations for children with ADHD are federally mandated, and mental health providers are required to ensure that patients and families have access to adequate and appropriate educational resources. Organizations such as Children and Adults with Attention Deficit Disorder (CHADD) and the National Attention Deficit Disorder Association can be helpful sources of information and support for families.

Multimodal Treatments

Many researchers and families have long suspected that multimodal treatment—medication used together with multiple psychosocial interventions in multiple settings—should be more effective than medication alone. Multimodal treatment has thus been used in the absence of empirical support (Hechtman, 1993). To determine whether multimodal treatment is indeed effective, the recent NIMH Multimodal Treatment Study of ADHD (called the MTA Study) examined three experimental conditions: medication management alone, behavioral treatment alone, or a combination of medication and behavioral treatments. The study compared the effectiveness of these three treatment modes with each other and with standard care provided in the community (the control group). The behavioral treatment condition consisted of parent training, a school intervention, and a summer treatment program. The MTA Study was also designed to determine the relative benefits of these treatments over time (Richters et al., 1995). All subjects were treated for 14 months and then followed for an additional 22 months.

Results of the MTA Study comparing the 14-month outcomes of 579 children randomly assigned to one of the four treatment conditions were presented in the fall of 1998 (MTA Cooperative Group, 1998). At 14 months, medication and the combination treatment were generally more effective than the behavioral

treatment alone or the control treatment. Notably, the combined treatment resulted in significant improvement over the control condition in six outcome areas—social skills, parent child relations, internalizing (e.g., anxiety) symptoms, reading achievement, oppositional and/or aggressive symptoms, and parent and/or consumer satisfaction—whereas the single forms of treatment (medication *or* behavior therapy) were each superior to the control condition in only one to two of these domains. The conclusions from this major study are that carefully managed and monitored stimulant medication, alone or combined with behavioral treatment, is effective for ADHD over a period of 14 months. Addition of behavioral treatment yields no additional benefits for core ADHD symptoms but appears to provide some additional benefits for non-ADHD-symptom outcomes.

Treatment Controversies

Overprescription of Stimulants

Concerns have been raised that children, particularly active boys, are being overdiagnosed with ADHD and thus are receiving psychostimulants unnecessarily. However, recent reports found little evidence of overdiagnosis of ADHD or overprescription of stimulant medications (Goldman et al., 1998; Jensen et al., 1999). Indeed, fewer children (2 to 3 percent of school-aged children) are being treated for ADHD than suffer from it. Treatment rates are much lower for selected groups such as girls, minorities, and children receiving care though public service systems (Bussing et al., 1998a, 1998b). However, there have been major increases in the number of stimulant prescriptions since 1989 (Hoagwood et al., 1998), and methylphenidate is being manufactured at 2.5 times the rate of a decade ago (Goldman et al., 1998). Most researchers believe that much of the increased use of stimulants reflects better diagnosis and more effective treatment of a prevalent disorder. Medical and public awareness of the problem of ADHD has grown considerably, leading to longer treatment, fewer interruptions in treatment, and increased treatment of adults. Adolescents and younger girls with ADHD, who were underdiagnosed in the past, are being identified and treated.

Nonetheless, some of the increase in use may reflect inappropriate diagnosis and treatment. In one study, the rate of stimulant treatment was twice the rate of parent-reported ADHD, based on a standardized psychiatric interview (Angold & Costello, 1998). While many children who do meet the full criteria for ADHD are not being treated, the majority of children and adolescents who are receiving stimulants did not fully meet the criteria. These findings may reflect a failure of proper, comprehensive evaluation and diagnosis rather than a failure of the diagnostic criteria, which are clear and validated by research (Angold & Costello, 1998). A diagnosis of ADHD requires the presence of impairing ADHD symptoms in *multiple* settings for at least 6 months. Although fidgeting and not paying attention are normal, common childhood behaviors, DSM-IV criteria reserve a diagnosis of ADHD for children in whom such frequent behavior produces persistent and pervasive dysfunction. An adequate diagnostic evaluation requires histories to be taken from multiple sources (parents, child, teachers), a medical evaluation of general and neurological health, a full cognitive assessment including school history, use of parent and teacher rating scales, and all necessary adjunct evaluation (such as assessment of speech, language). These evaluations take time and require multiple clinical skills. Regrettably, there is a dearth of appropriately trained professionals.

Family practitioners are more likely than either pediatricians or psychiatrists to prescribe stimulants and less likely to use diagnostic services, provide mental health counseling, or provide followup care (Hoagwood et al., 1998). The American Academy of Pediatrics published a policy statement in 1996 on the use of medication for children with attentional disorders, concluding that use of medication should not be considered the complete treatment program for children with ADHD and should be prescribed only after a careful evaluation (American Academy of Pediatrics Committee on Children With Disabilities and Committee on Drugs, 1996).

Safety of Long-Term Stimulant Use

Even though the MTA Study found no safety issues over a 14-month period (Greenhill et al., 1998), concerns have been raised about the longer term safety of stimulant treatment. Since ADHD has an early onset and requires an extended course of treatment, research is needed to examine the long-term safety of treatment and to investigate whether other forms of treatment could be combined with psychostimulants to lower their dose as well as to reduce other problem behaviors found with ADHD. Such combined treatments could be targeted for symptoms of disorders that often accompany ADHD, such as conduct disorder, substance abuse, and learning disabilities, and could be targeted to improve overall functioning (Laufer, 1971; Gittelman et al., 1985).

Because stimulants are also drugs of abuse and because children with ADHD are at increased risk for a substance abuse disorder, concerns have also been raised about the potential for abuse of stimulants by children taking the medication or diversion of the drug to others. While stimulants clearly have abuse potential, the rate of lifetime nonmedical methylphenidate use has not significantly increased since methylphenidate was introduced as a treatment for ADHD, suggesting that abuse is not a major problem (Goldman et al., 1998). Case reports describing abuse by children prescribed stimulants for ADHD are rare (Hechtman, 1985).

Depression and Suicide in Children and Adolescents

In children and adolescents, the most frequently diagnosed mood disorders are major depressive disorder, dysthymic disorder, and bipolar disorder. Because mood disorders such as depression substantially increase the risk of suicide, suicidal behavior is a matter of serious concern for clinicians who deal with the mental health problems of children and adolescents. The incidence of suicide attempts reaches a peak during the midadolescent years, and mortality from suicide, which increases steadily through the teens, is the third leading cause of death at that age (CDC, 1999; Hoyert et al., 1999). Although suicide cannot be defined as a mental disorder, the various risk factors—especially the presence of mood disorders—that predispose young people to such behavior are given special emphasis in this section, as is a discussion of the effectiveness of various forms of treatment. The evidence is strong that over 90 percent of children and adolescents who commit suicide have a mental disorder, as explained later in this section.

Major depressive disorder is a serious condition characterized by one or more major depressive episodes. In children and adolescents, an episode lasts on average from 7 to 9 months (Birmaher et al., 1996a, 1996b) and has many clinical features similar to those in adults. Depressed children are sad, they lose interest in activities that used to please them, and they criticize themselves and feel that others criticize them. They feel unloved, pessimistic, or even hopeless about the future; they think that life is not worth living, and thoughts of suicide may be present. Depressed children and adolescents are often irritable, and their irritability may lead to aggressive behavior. They are indecisive, have problems concentrating, and may lack energy or motivation; they may neglect their appearance and hygiene; and their normal sleep patterns are disturbed (DSM-IV).

Despite some similarities, childhood depression differs in important ways from adult depression. Psychotic features do not occur as often in depressed children and adolescents, and when they occur, auditory hallucinations are more common than delusions (Ryan et al., 1987; Birmaher et al., 1996a, 1996b). Associated anxiety symptoms, such as fears of separation or reluctance to meet people, and somatic symptoms, such as general aches and pains, stomachaches, and headaches, are more common in depressed children and adolescents than in adults with depression (Kolvin et al., 1991; Birmaher et al., 1996a, 1996b).

Dysthymic disorder is a mood disorder like major depressive disorder, but it has fewer symptoms and is more chronic. Because of its persistent nature, the disorder is especially likely to interfere with normal adjustment. The onset of dysthymic disorder (also called dysthymia) is usually in childhood or